

**NATIONAL TRANSPORTATION SAFETY BOARD**  
Vehicle Recorder Division  
Washington, D.C. 20594

December 1, 2015

## **Locomotive Event Recorder**

### **Specialist's Factual Report By Cassandra Johnson**

#### **1. EVENT SUMMARY**

Location: Petal, Mississippi  
Date: August 12, 2015  
Company: Norfolk Southern Railroad  
Locomotive ID: Norfolk Southern Railroad 6649<sup>1</sup>  
NTSB Number: DCA15FR013

On August 12, 2015, about 10:39 p.m. central daylight time, a Norfolk Southern Railroad (NS) conductor trainee was fatally injured while conducting switching operations as part of a local switching crew. The train consisted of four crewmembers; engineer, conductor, brakeman and conductor trainee (fatality).

#### **2. LOCOMOTIVE EVENT RECORDER GROUP**

A locomotive event recorder group was not convened.

#### **3. DETAILS OF RECORDER INVESTIGATION**

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received a locomotive event recorder file from NS6649.

##### **3.1. Locomotive Event Recorder Recording Description**

Using the wheel size of 39.20 inches as provided by investigators, NS6649's locomotive event recorder data were extracted using the Quantum Desktop Playback Software. The software outputted the locomotive event recorder parameters including distance and speed. The exported data has a sampling rate of one second; therefore, the data has an accuracy of +/- 1 second. Only the data relevant to this event are provided in this report.

##### **3.2. Parameters**

Table A-1 lists the parameters verified and provided in this report for NS6649. Additionally, table A-2 contains the unit and discrete state abbreviations for the parameters.

##### **3.2.1. Distance Traveled**

The default output for the locomotive event recorder's distance traveled started at 0 and the

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<sup>1</sup> For the rest of this report, Norfolk Southern Railroad locomotive number 6649 will be referred to as NS6649.

values were significantly large near the event. Therefore, for convenience, the distance traveled were zeroed when the locomotive stopped moving after the event.

### **3.3. Locomotive Event Recorder Timing**

The recorded time from NS6649's locomotive event recorder data file is independently time stamped. As a consequence of the independent time stamping, recorded times may not reflect the actual time of the day. Therefore, all times in this report and attachment are referenced as Recorder Time.

### **3.4. Plots and Corresponding Tabular Data**

Figures 1 and 2 contain locomotive event recorder data from NS6649 recorded during the August 12, 2015 event. All the parameters listed in table A-1 were plotted except miles traveled.

Figure 1 covers the last three times NS6649 moved on August 12, 2015 between 22:20:00 and 22:43:00. Figure 2 has an expanded scale from 22:33:00 to 22:41:20 and focuses on the last two movements of NS6649.

In brief, NS6649's locomotive event recorder data indicated between 22:21:44 and 22:29:31, NS6649 moved forward 3,936 feet (ft) with a maximum speed of 8 miles per hour (mph). Four minutes and 42 seconds later at 22:34:13 until 22:36:14, NS6649 moved in reverse 447 ft with a maximum speed of 4 mph. One minute and 7 seconds later at 22:37:21 until 22:38:04, NS6649 moved in reverse 96 feet with a maximum speed of 2 mph.

All of the corresponding tabular data used to create figures 1 and 2 are provided in electronic comma separated value (.csv) format as attachment 1 to this factual report.

Figure 1: NS6649 locomotive event recorder parameters (from 22:20:00 to 22:43:00).

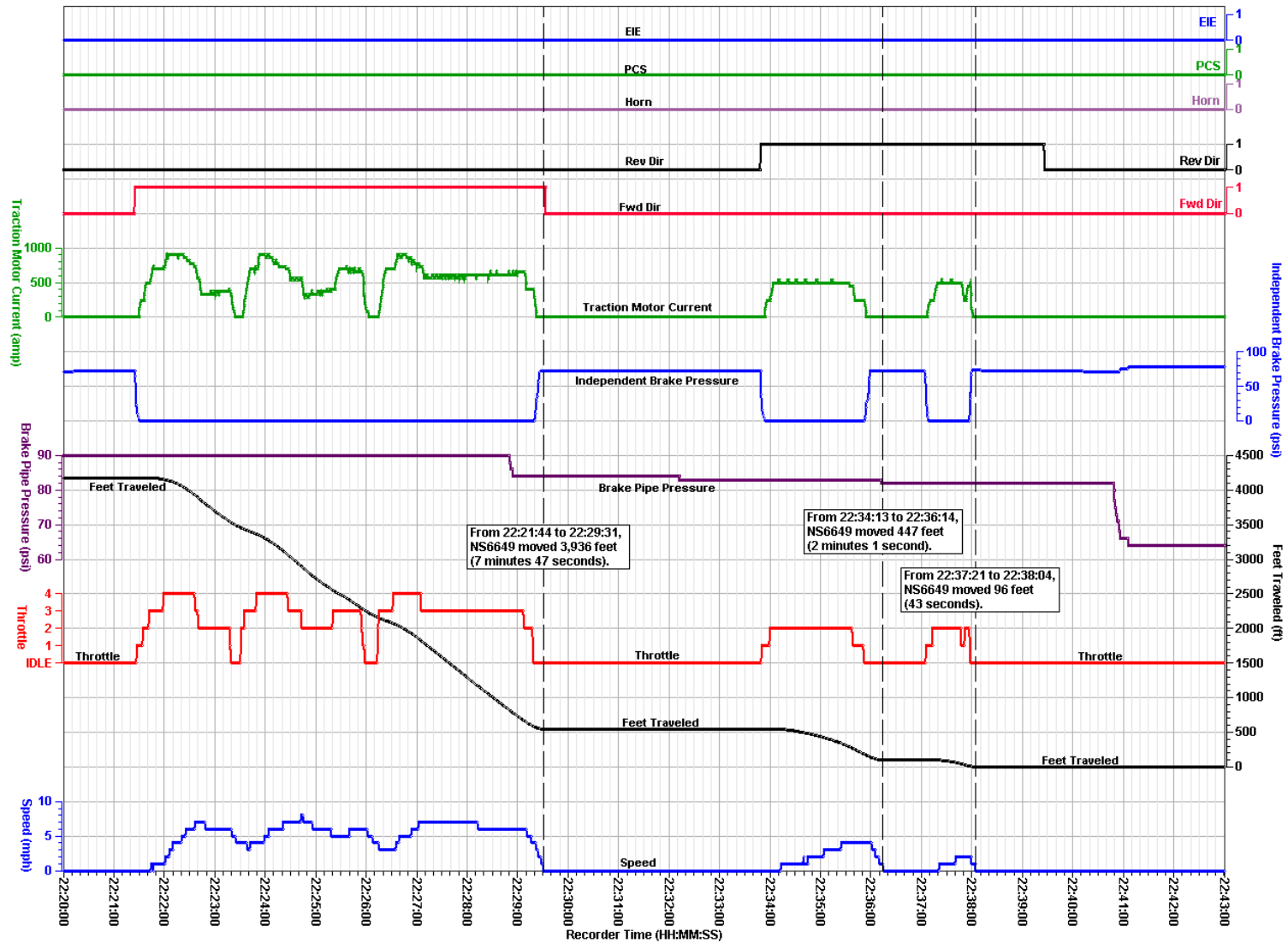
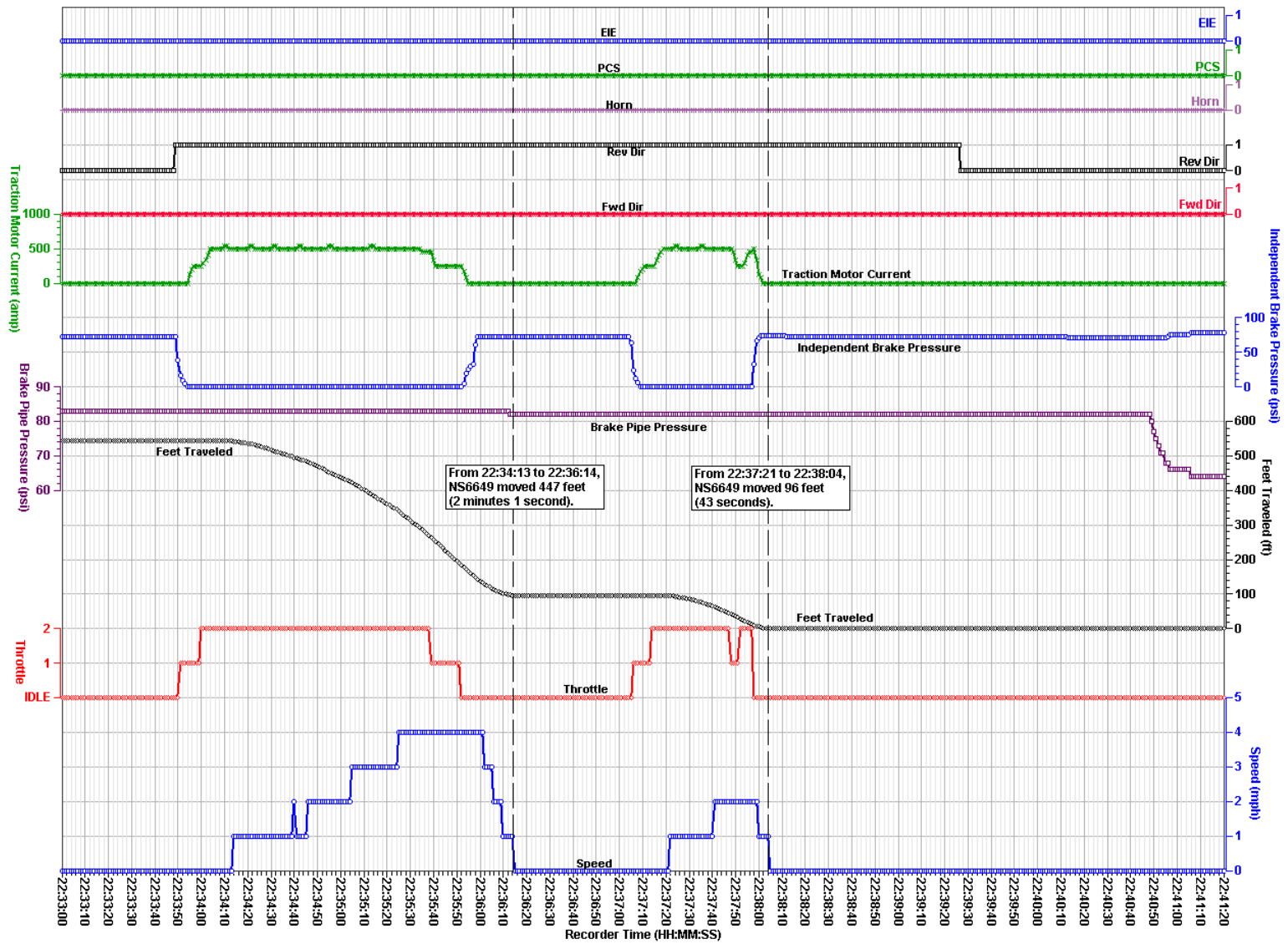


Figure 2: NS6649 locomotive event recorder parameters (22:33:00 to 22:41:20).



## APPENDIX A

This appendix describes the locomotive event recorder parameters provided and verified in this report for NS6649. Table A-1 lists the parameters and table A-2 contains the unit and discrete state abbreviations for the parameters.

**Table A-1. Verified and provided locomotive event recorder parameters for NS6649.**

Parameter Name	Parameter Description
1. Brake Pipe Pressure (psi)	Brake Pipe Pressure
2. EIE (discrete)	Engineer Initiated Emergency
3. Feet Traveled (ft)	Feet Traveled
4. Fwd Dir (discrete)	Forward Direction of Travel
5. Horn (discrete)	Horn
6. Independent Brake Pressure (psi)	Independent Brake Pressure
7. Miles Traveled (miles)	Miles Traveled
8. PCS (discrete)	Pneumatic Control Switch
9. Rev Dir (discrete)	Reverse Direction of Travel
10. Speed (mph)	Speed
11. Throttle (discrete)	Throttle Position
12. Traction Motor Current (amps)	Traction Motor Current

**Table A-2. Unit and discrete state abbreviations.**

Units Abbreviation	Description
1	Throttle Position 1
2	Throttle Position 2
3	Throttle Position 3
4	Throttle Position 4
amps	amperes
discrete	discrete
ft	feet
mph	miles per hour
psi	pounds per square inch

NOTE: For parameters with a unit description of discrete, a discrete is typically a 1-bit parameter that is either a 0 state or a 1 state where each state is uniquely defined for each parameter.